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A Novel School of Horticulture.

DURING its session of 1894, the Legislature of the State of New York passed what was known as the Experiment Station Extension Bill, which, among other provisions, appropriated $8,000 to be expended in the western counties of New York, under the direction of Cornell University, for the benefit of horticulture. The fund was to be used in conducting experiments and investigations, in studying plant-diseases and the most profitable ways of fertilizing vineyards, fruit-orchards and gardens, and in publishing the results of such investigations and in disseminating horticultural knowledge by means of lectures and otherwise. Early in December we received a conspectus of a School of Horticulture, to be held in Chautauqua County on the last week of the year during four days and to be conducted by Professor L. H. Bailey, in accordance with the provisions of the act we have quoted above.

The programme, as announced, looked attractive. It seemed that this school of horticulture was the very natural and satisfactory development of the Farmers' Institutes which are held in various parts of the country now, and many of which have become specialized so as to take up a single branch of agriculture like dairy husbandry, fruit-culture or the like. The most noteworthy fact brought out in the announcement was, that although this institute was to be held in one of the famous grape-growing regions of the state, small promise of instruction was offered in what might be called the practical and every-day working details of horticulture or viticulture. Only one afternoon was to be occupied in any matter of manual skill, and this time, devoted to general nursery practice, was given largely to a discussion of principles rather than of methods. The course was confined almost exclusively to the fundamental principles of horticultural science. Thus, the subject of the first half-day's session was How Plants Live and Grow, accompanied by demonstrations with the microscope by Professor Rowlee. Another half-day's topic was a brief on the Evolution of Plants, with the Origin of Varieties. One session was devoted to the Geological History of Soils, with stereopticon views; another to the Chemistry of the Grape and of the Soil; another to the theory of tillage and the productivity of land; another to the subject of Fungi, with stereopticon views. This tendency toward strict science is something like an innovation on the ordinary Farmers' Institute work, but, plainly, it was the proper course to pursue, and it promised to furnish the students with what was really the most practical kind of information which could be given them within the period named. Another interesting point was that each session was to begin with lessons in observation. At one session the subject to be studied was twigs, at another fruit-buds, and again seeds, leaves, flowers, fruits, and last of all, the apple. This also appeared to us to be a feature full of pleasing promise, and we have, therefore, made some inquiries of persons who attended the school, both in the capacity of instructors and as students, to ascertain whether the venture had proved satisfactory.

From the letters received we learn that sixty persons registered as students, and nearly all of them answered to the roll-call at every session. These students were all practical horticulturists, most of them grape-growers in the famous Chautauqua valley; among them were two or three physicians, a clergyman and others who had adopted the pursuit of horticulture either as a business or a diversion. The interest increased as the sessions went on, and nearly all the students took notes upon the lectures and passed satisfactory examinations on them afterward. Perhaps this is the first school or institute of the kind which was ever held in this country, and it seems to have been unqualifiedly successful. The observation-lessons were remarkably stimulating, and it was surprising to see what interest even the elderly men took in the simplest objects. When twigs of various kinds were passed about the first day, ten minutes for observation were allowed, and then the various members of the class were asked what they had seen. As the subject of phyllotaxy, or the arrangement of buds on the stem, had not been studied by many of them, the class became almost excited as the mathematical ratios developed by the arrangement were brought out. This experience was repeated at every session, for there was not a single observation-lesson in which the discovery of some equally striking law or truth was not made by carefully studying the most familiar objects which had been before their eyes every day of their lives. Perhaps the most interesting lesson of all was the very last one, when, after the flowers had been studied, the structure of the apple was taken up. As the meaning of the various parts of the fruit was revealed, and their relations to the parts of the flowers became evident, the wonder of many members of the class at what was novel information to them was very manifest.

Of course, it is not to be expected that accomplished horticulturists will be graduated from a school like this after four days of instruction, but whenever a man learns new fundamental scientific truth he becomes to this extent more intelligent in the practice which rests upon this truth. Certainly a man will cultivate his land more efficiently after he has listened to the explanation of Professor Roberts, who showed in what way tillage promoted capillarity of the soil and how it brought fertility to the plant, set free mineral nutrients, hastened nitrification, presented new surfaces to rootle's, conserved moisture, and did much more besides. With some knowledge of these fundamental principles any horticulturist would be better able to judge when to cultivate and how to cultivate. It is not to be assumed that Professor Caldwell in his lectures on the chemistry of the soil and of the grape made expert analysts of any of the Chautauquans, or that in a single afternoon Professor Rowlee made plain to his hearers all the intricate processes in the nutrition of plants. Nevertheless, on these and other subjects alert, level-headed men and women familiar with all the phenomena of plant-growth will very readily seize upon some fundamental scientific principles which will aid them very materially in their every-day work. Not only will new ideas throw new light on the reasons for their practice, but it will lead them to inquire for more knowledge as they attempt to adjust their practice to their new-found

knowledge, and, more than that, the substantial and indisputable truths here acquired will probably avail to keep them from many costly mistakes by showing them the impracticability of projects which to the utterly uninstructed might seem promising.

We are glad that the first horticultural institute of this sort has been held under such favorable auspices. We consider it a step forward in the means and methods of popular instruction. A little knowledge is not a dangerous thing when it is rudimentary and fundamental knowledge. The dangerous kind referred to by the poet is a superficial smattering.

Notes on the Tree Flora of the Chiricahua Mountains.—II.

ASCENDING the cañon, on the mountains at either side, were large areas of Scrub Oak, including Quercus undulata, Q. hypoleuca and Q. chrysolepis vacciniifolia. Two other Oaks, Q. Gambelii and Q. reticulata, were found farther up among the Pines and Cypress. Quercus Gambelii is known as Pin Oak, and, although here a small shrub, produces a trunk eighteen inches or two feet in diameter farther north. Q. reticulata is also generally a shrub, but in moist places in deep cañons it not infrequently approaches a tree in size and habit. This species, although very near Q. grisea in specific characters, is quite different in general appearance. The bark is much smoother, the foliage a deeper green, and the cups, with their long peduncles, remain on the branches several months after the acorns have fallen. In July the peduncles of the former year were still on the branches. An Oak was found at old Camp Rucker which has been referred to Q. grisea, but which has the general aspect of Q. oblongifolia. It has the same bluish cast to the leaves, and but little roughness on the under surface. The peduncles are long, something like those of Q. reticulata. By examining the acorns of these three species it will be seen that they are almost identical. They are very astringent, and the cotyledons are a deep purple color.

Yucca macrocarpa was found in abundance throughout the south and central portions of this range. It is strictly a mountain plant, frequent in shady cañons at an elevation of from three to six thousand feet. This species seldom gets beyond the foot-hills, and is in full bloom by the 20th of July and ripens its fruit by the 10th of September. Y. baccata is a more northern plant, but covers large areas on the east slope of the Chiricahua Mountains between Gayleyville and Fort Bowie. Its habit of growth is entirely different from Y. macrocarpa. The caudex, if at all long, lies prostrate on the ground, while Y. macrocarpa is always upright. Yucca elata, the most widespread Yucca of Arizona, is frequent on the mesa at either side of this range. It is a plains plant, and never found in the mountains. It reaches its maximum size in south central Arizona, and is in full bloom by the first of June, and ripens its fruit a month or six weeks later. The Yucca of the Colorado plateau, which has been referred to this species, is quite different, and should, I believe, be considered a new species.

Two arborescent species of Cacti—namely, Opuntia arborescens and O. fulgida—are frequent in the valley west of the mountains. Both of these species form small trees, with trunks sometimes eight or ten inches in diameter.

A few miles below old Camp Rucker the first Pines were observed, and from here they increased in size and frequency almost to the summit. The first species observed were Pinus cembroides and P. Chihuahuana * (see page 24). Several miles above the old camp were many large specimens of P. latifolia† (see page 25) and P. ponderosa. I am inclined to the opinion that all the long-leaved, broken-cone Pines of southern Arizona are at most only varieties of Pinus ponderosa. There seems to be all variations, from the long-leaved to the short-leaved forms.

Abies concolor, Pseudotsuga taxifolia and Cupressus Arizonica were not infrequent in the cañons above five thousand feet. The Arizona Cypress is a rare tree, only growing in a few of the mountain ranges of the territory. The largest specimens observed here were eighteen inches in diameter and fifty feet high. There is a large grove containing many thousand of these trees at the Natural Bridge in central Arizona. They are very symmetrical, and many of them fully three feet in diameter. The bark has a reddish cast and peels off in long shreds. This character, however, was not observed in the specimens seen in the Chiricahua Mountains.

I much regret that I was unable to get to the highest point of these mountains, as there are probably trees growing there which are not in the following list. I was informed by a Mr. McGray, a ranchman thoroughly familiar with the mountains, that a White Pine and a Larch were growing at the summit. It is not improbable that a White Pine, probably Pinus reflexa, does grow there, as it is found in many of the other ranges of southern Arizona. I seriously question the possibility of finding a Tamarack there.

In Turkey Creek cañon, which opens toward San Simon Valley, just south of Fort Bowie, were fine specimens of Acer barbatum grandidentatum. A. Negundo and Prunus serotina. This latter species shows a great variation in the size and flavor of the fruit. The trees in this cañon were especially noticeable for their large fruits, with comparatively small pits. It is not impossible that this species might be made of considerable horticultural importance.

Cercocarpus parvifolius paucidentatus and Rhamnus Purshiana tomentella are frequent throughout the entire range. The former appears very different from Cercocarpus parvifolius, and very likely is specifically distinct. Large areas of San Simon Valley are covered with a stunted growth of Prosopis juliflora and Kœberlinia spinosa. The spines of the latter species are said to be poisonous, and produce a stinging sensation when they pierce the skin.

I append a list of the trees collected in the Chiricahua Mountains and in the adjacent valleys. Of course, it is understood that a large percentage of this list were observed in several of the ranges visited. It is quite remarkable that this one range in the very south-eastern portion of Arizona has over fifty species of trees, or more than one-ninth of the total number in the United States:

Condalia obovata, Kœberlinia spinosa, Rhamnus Purshiana, Rhamnus Purshiana tomentella, Acer barbatum grandidentatum, A. Negundo, Sapindus marginatus, Acacia Berlandieri, A. Greggii, Robinia Neo-Mexicana, Prosopis juliflora, Parkinsonia Torreyana, P. microphylla, Eysenhardtia orthocarpa, Prunus serotina, Vauquelinea Californica, Cercocarpus parvifolius paucedentatus, Cereus giganteus, Opuntia arborescens, O. fulgida, Sambucus Mexicana, Arbutus Arizonica, Bumelia spinosa, Fraxinus velutina, Chilopsis saligna, Celtis Mississippiensis reticulata, Morus celtidifolia, Platanus Wrightii, Juglans rupestris, Quercus Gambelii, Q. undulata (several widely varying forms), Q. oblongefolia, Q. grisea, Q. reticulata, Q. chrysolepis vaccinifolia, Q. Emoryi, Q. hypoleuca, Q. n. sp., Alnus oblongifolia, Salix nigra, S. longifolia, var., S. sp.,

* This species, which is well distinguished from all other Pine-trees bearing their leaves in clusters of threes by the deciduous-leaved sheaths, was discovered by Wislizenus on the mountains of Chihuahua, and first described fifty years ago by Dr. George Engelmann, to whose long and patient studies we are indebted for much exact information on the Pine-trees of western and south-western North America, the great headquarters of the genus. Much later, Pinus Chihuahuana was found on several of the mountain ranges of southern New Mexico and Arizona, where, scattered among Pinus Arizonica, Pinus ponderosa and Pinus reflexa, near the upper borders of the Live Oak forests which cover the lower slopes of these mountains, it is a comparatively rare tree, and seldom grows to the height of sixty or seventy feet. The wood is soft and brittle, and Pinus Chihuahuana, although it possesses considerable scientific interest, has little economic significance as an inhabitant of our forests.

† In vol. iL of Garden and Forest (page 498) this Pine tree, closely related to Pinus ponderosa, which had been found by Dr. Henry Mayr, the German forester, some time previously on the Santa Rita Mountains of Arizona, was described and figured. It is distinguished by its very long broad leaves and by the stout recurved umbos of the more or less mammæformed basal cone scales; and in these characters appears very unlike forms of that well-known and very variable tree from more northern regions. There is such a resemblance to other forms of Pinus ponderosa, however, in the bark, habit and general appearance of this Arizona tree which were not known when Dr. Mayr's specimens were described that it is not improbable, when this western American Yellow Pine group is studied in all its forms, that it will be necessary to include among them the long-leaved Arizona tree, of which there are two or three remarkable varieties. On the Santa Rita, Huachuca and Chiricahua Mountains this tree is not rare at elevations of about seven thousand feet above the sea, where it grows on stony slopes with a short-leaved variety of Pinus ponderosa just below the belt of Pinus cembroides, which covers, with a rather dense forest, the highest slopes of these mountains.

Populus tremuloides, P. Fremontii, Cupressus Arizonica, Juniperus pachyphlœa, J. occidentalis monosperma, J. Virginiana, Pinus reflexa, P. cembroides, P. Arizonica, P. ponderosa, P. latifolia, P. Chihuahuana, Pseudotsuga taxifolia, Abies concolor, Yucca elata, Y. macrocarpa.

Tucson, Arizona. *J. W. Toumey.*

An Indian on Indian Corn.

THE Penobscot tribe of Indians, on the Penobscot River, some three or four miles above the city of Bangor, Maine, has a considerable "reserve," consisting chiefly of some large islands. Some of these Indians are farmers, though most of the men are engaged in lumbering, which is extensively carried on at that point. They have very good schools, and as I have several times taken the up-river train in the morning from Bangor, I have been pleased in observing the well-dressed and intelligent-looking Indian girls and boys who avail themselves of the same train on their way to school. They do not seem in any way inferior to their white companions on the same train, either in the neatness of their apparel or in general good looks.

I have also had an opportunity of becoming personally acquainted with a few of the leading men of the tribe, and with one of these, Mr. Peol Susup, I have corresponded on a number of subjects, one of which was Indian Corn. I had been trying to develop and improve the dwarf and early varieties which are alone suited to the elevated northeastern portion of Vermont, and in reply to my inquiries Mr. Susup wrote to me as follows:

Indian Corn is called by the Indians Weachin, and it is believed to have originated in Mexico. When white men arrived in America they found it in cultivation from latitude forty degrees south to the island of Orleans, in the St. Lawrence River. That was probably its extreme limit in the northeast. How it could have been propagated and ripened so far north of its native tropical home has been a subject of curious speculation. Every cultivator has doubtless noted how difficult it is to perfect the plant from seed obtained at any considerable distance south of the region in which he endeavors to raise it. Seed procured from New York will seldom or never perfect itself in Maine, and it is deemed unsafe to plant that brought from Massachusetts. How, then, did the Indian, without other agricultural education than that derived from his own unrecorded and imperfect observations, push its production from the Gulf of Mexico to the St. Lawrence? He certainly accomplished this result ages before the white man visited him; and it was to the natives that the early white settlers of New England were indebted for their seed corn of the varieties now in use.

An annual plant may extend itself east, or west, along isothermal lines, by accidental causes; but it could not have moved into a colder climate, requiring cultivation and care, without great attention, and the application of more than ordinary skill. It must have required ages to have been acclimated in that country now constituting Canada and the New England states.

The Indian has a tradition regarding the method by which the northern varieties of Corn were obtained and perfected. Like all the grasses, and many other annual plants, Corn grows upward by joints or sections. The Indians observed that the time required to produce and perfect a joint was one change of the moon; and as the ear of corn starts only from a joint there was necessarily about seven days between the forming of the ears on successive joints. Now, if an ear can be made to start at the second joint, it would mature some five weeks in advance of that which should be formed on the seventh joint. By constantly selecting for seed the lowest ears, he finally obtained varieties that produced from joints lower than the original plant, and very much earlier. Thus, in time, corn was produced, small in stalk and ear, and adapted to the short summers of the north. Slowly, but permanently, it passed into the eight-rowed corn, producing constantly on the lower joints, and ripening in three months from the day of planting.

I may add to Mr. Susup's account an early memory of my boyhood. My grandfather was, in 1792, an emigrant from the valley of the lower Connecticut River, near Windsor, Vermont, to Kennebeck County, Maine. He found it difficult to obtain at that time any variety of Corn that was safe to grow, even in south-western Maine; but later he supplied himself with a sure-ripening variety called the Canada Creeper, which produced its ears very near the ground. In the elevated region of north-eastern Vermont, where I have now lived for nearly thirty years, I found the same trouble, and surmounted it in the same way; but by careful selection I have greatly increased the length of the ears, and the consequent productiveness, without lessening the earliness of the crop. My annual yield of this corn, when dry and shelled, is rarely as low as fifty bushels an acre.

Newport, Vt. *T. H. Hoskins.*

Foreign Correspondence.

London Letter.

ARUNDINARIA MACROSPERMA (A. tecta) is a North American Bamboo, which is very much wanted by growers of hardy Bamboos in this country, but at present it cannot be obtained for love or money. None of the American nurserymen catalogue it, and none of the many likely people in America who have been asked to send plants of it have so far responded, until it has been questioned whether this Bamboo is to be found in the United States after all. We have all read of "cane-breaks," and have been informed that they are formed of big stretches of A. macrosperma. Is it possible that they have all disappeared? If not, and there are plenty of plants of it to be got for the digging, I would recommend some enterprising nurseryman to advertise the plant at so much per hundred in some English horticultural paper, and, unless I am much mistaken, he will have reason to be glad for this suggestion. We have a clump of it at Kew, where it is perfectly hardy and evergreen, and, consequently, is much coveted by the majority of those who see it here.

RHODODENDRON KEISKEI.—This species was described by Maximowicz in 1870 in a paper published in the *Memoirs of the Academy of Sciences*, of St. Petersburg. Plants of it are in cultivation at Kew, and one of them has lately flowered. In the form and color of the flowers it most resembles Rhododendron Dahuricum, which flowers in winter, but there is a marked difference between the two in habit and foliage. R. Keiskei is dwarf in habit, with trailing branches, biennial, elliptic, ovate, leathery leaves three inches long, green above, clothed with reddish lepidote spots below. The flowers are in loose corymbs of from three to five; calyx lobes nearly obsolete; corolla campanulate, an inch across, colored rose-purple; stamens ten, declinate, the filaments slightly hairy at the base. The plant is quite hardy at Kew, and, judging from Maximowicz's description and figure, it is likely to prove at least as useful as R. Dahuricum. It is a native of Kyushu and of Hondo, where it is sometimes cultivated in the gardens of Tōkyō.

KNIPHOFIA NATALENSIS.—This species was first described some eight years ago from specimens sent to Kew by Mr. Medley Wood, of Natal. A plant of it from the same source flowered in a cold greenhouse at Kew in June, 1889, the scape in this case being two and a half feet long, bearing a loose spike of drooping orange-yellow flowers an inch long. A short time ago Herr Max Leichtlin sent to Kew a plant which he thought would prove to be a new species. He had received it from Natal. With him it flowered in winter, and had leaves four feet long. It is now in flower at Kew, and while it does not specifically differ from Kniphofia Natalensis, it is superior to the type in having the flowers much denser on the spike, and in their color being a uniform citron-yellow. If it should prove to be constant in flowering in midwinter it will prove a useful plant for the conservatory. There are now about thirty species of Kniphofia, or double the number known in 1870, when Mr. Baker monographed the genus. The extremes of the genus are represented by the gigantic K. Northiæ and K. aloides on the one side, and the tiny K. pallidiflora and K. pauciflora on the other. They are all worth a place in the garden.

Howardia Caraccasana.—The genus Howardia, or Pogonopus, is nearly allied to Pinckneya pubens, the beautiful Rubiaceous tree found wild in Florida and Carolina, but, so far as I know, never yet successfully grown in England, notwithstanding numerous earnest attempts. The Howardia under notice is not, however, so recalcitrant, for it has flowered at Kew several times within the last twenty years, and it is in flower now. It grows to a large size if allowed to, Mr. Howard, the Cinchona expert, after whom it was named by Weddell, having grown a large bush of it in his garden at Tottenham. The plant in flower at Kew now is only eighteen inches high; it has opposite, stalked, light green leaves and terminal loose panicles of tubular pink flowers an inch long, subtended by foliaceous bracts colored rose-pink, with yellowish tips. The genus Mussænda, also Rubiaceous, has the same peculiar character, but in that genus all the species have white bracts and comparatively small yellow flowers. The Howardia is a meritorious winter-flowering stove plant. There is a good figure of it in the *Botanical Magazine*, t. 5110 (1859), where it is described as "a very lovely stove-plant with gracefully drooping panicles of flowers, whose beauty is very much increased by the remarkable enlargement of one of the teeth of the calyx into a heart-shaped, petiolated, deep rose-colored, foliaceous lobe." It appears to have been distributed by Messrs. Makoy & Co., of Liège, many years ago under the name of Pinckneya ionantha.

Dracæna Godseffiana is a stove plant of exceptionally pleasing and distinct character. It is represented by hundreds of plants in the St. Albans nurseries and will shortly be distributed by Messrs Sander & Co. as a new foliage-plant. I have already called attention to it in Garden and Forest, but it is good enough to be mentioned again. It is a true Dracæna, not a Cordyline, the correct generic appellation of the plants known in gardens as D. terminalis, D. indivisa, D. recurva, etc., and most resembles the old D. surculosa, for which it was at first mistaken. Now that it is in character, however, its distinctness from all other cultivated representatives of this genus is very evident. It has thin wiry stems, branches and suckers freely, and its ovate, elegantly waved leaves are colored glossy green, with numerous large spots of creamy white, suggesting in variegation the leaves of a good variety of Aucuba Japonica. It is easily propagated from stem-cuttings or by division, and it grows freely. It is a native of Lagos, whence it was introduced about three years ago.

Tea Cultivation.—The monopoly of the tea trade by China has long since been broken down, the tea plant being now cultivated in India, Ceylon, Natal, Mauritius and other countries with more or less success. Its cultivation under glass in England even has been suggested as a profitable undertaking. Russia, hitherto China's best customer for the choicest teas, has lately started tea plantations in Batoum, and, according to a recent consular report to the British Foreign Office, with every prospect of success. Chinese tea-planters have been employed to foster the industry, and in less than ten years the experiment has been productive of such satisfactory results that the Russian Government has set apart 43,000 acres to be turned into tea plantations. The methods of tea culture in practice in Ceylon, India and China are to be thoroughly studied by a commission sent for the purpose to those countries. The Chinese tea-plant, Thea chinensis, now called Camellia theifera, is hardy against a wall at Kew and forms a dense shrub six feet high in the temperate house. There is no reason, therefore, why it should not be cultivated with success wherever the Orange, Olive, Pomegranate, Persimmon and such like plants thrive in the open air. I am not aware if tea cultivation is an established industry in the southern United States, but if it is not, the experiment is well worth making. The Indian variety, T. Assamica, now called Camellia theifera, var. Assamica, is not so hardy and thrives best in an almost tropical climate. Tea seeds are easily imported from India or Ceylon and they germinate readily. The Assam variety was thus obtained by Kew and distributed to Mauritius, Jamaica, Natal and other colonies a few years ago, the seeds afterward germinating freely. Cultural directions are easily obtained, but I should say that a good loamy soil, a moderate supply of water, bright,

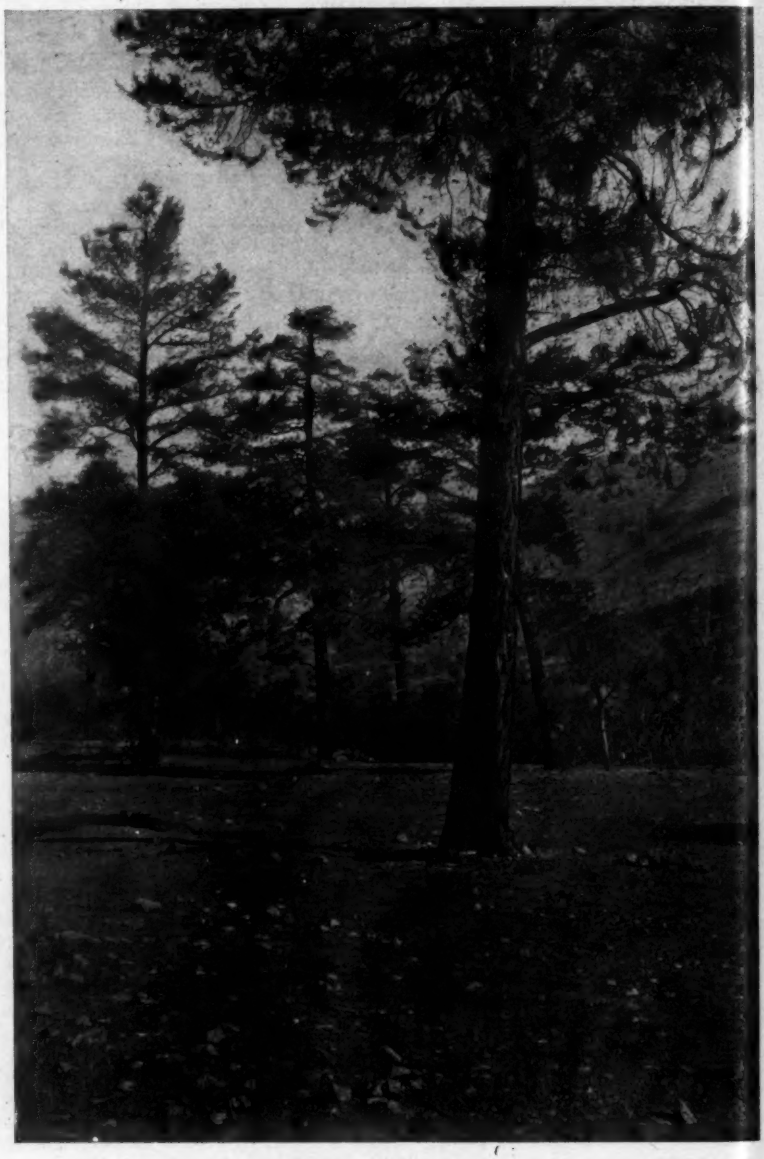

Fig. 3.—Pinus Chihuahuana.—See page 22.

warm sunshine in summer and a minimum winter temperature of about twenty-five degrees, Fahrenheit, are the conditions most essential to success.

London. *W. Watson.*

Plant Notes.

LONICERA STANDISHII AND L. FRAGRANTISSIMA.—We place these two Bush Honeysuckles together because they are both of Asiatic, probably Chinese, origin, and are so closely allied that they may ultimately be classified as varieties of a single species. Lonicera Standishii, which was introduced into England by Fortune, who found it a common garden-plant in Shanghai, is somewhat the hardier of the two, and its deciduous leaves indicate that it is of more northern origin. Both plants hold their leaves well into the autumn, but L. fragrantissima is nearly evergreen in Philadelphia, and, perhaps, entirely so not far south of that latitude. Both species open their flowers very early here, before the appearance of their leaves, and sometimes flowers appear quite abundantly in autumn before all the leaves have fallen. Fortune's plant was used quite generously in the original plantations of Central Park, and its white flowers are often seen in warm days in February, while their abundant bloom in April makes this Honeysuckle a feature of the park shrubberies. The flowers of both species are white, although there is a tendency toward rose-color in some individuals of L. Standishii. Some of the buds on both plants seem ready to open almost any warm day in winter, and if the twigs are cut off and placed in water in a warm room they will soon fill it with their fragrance, which resembles that of violets. It is noteworthy that this fragrance is quite as marked in the precocious flowers which appear in autumn as in those which wait until their regular season. Both these Honeysuckles are tall, stout-growing, twiggy shrubs with yellow-brown branches. Occasionally, after a mild winter, in which the buds have swelled more than usual, they are blasted by very cold weather in the spring, but there are usually enough remaining to open later and give a fair amount of bloom. In a good season it is not uncommon to find ripe berries among the open flowers in May.

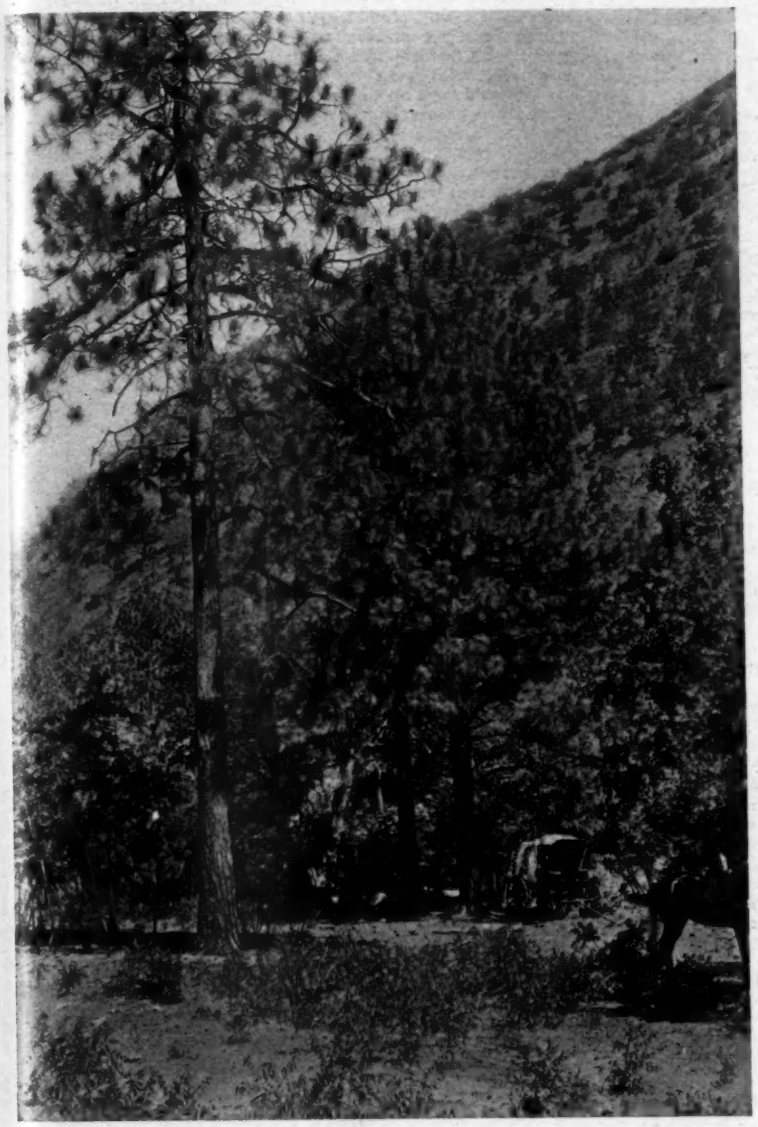

Fig. 4.—Pinus latifolia.—See page 22.

ACACIA PUBESCENS.—We have often spoken of this old plant, which was introduced into cultivation more than a century ago, but it is worth repeating here; that for certain purposes it is one of the very best of this large genus, and a well-grown specimen can hardly be excelled in grace of form. Seedling plants are the strongest. They make roots rapidly, and should be shifted on until the specimens occupy a large tub. When trained to a single stem they will attain the height of about ten feet, and the head will expand into as great a breadth, with drooping branches thickly hung with racemes of small globular sulphur-colored flowers, which appear to the best advantage among the delicate Fern-like foliage. These flowers, too, are delightfully fragrant. The plant is not particular as to soil. After the flowering season, which begins in February and lasts for about six weeks, the branches should be cut back, so that a specimen can be kept within the limit of convenient size for many years, and if the soil is well top-dressed it will always be in first-rate flowering condition. The natural habitat of the plant is southern Australia, and it can be kept in any house where the temperature does not fall below forty. The best treatment for young plants is to plunge them out-of-doors somewhere under a lath shelter, as they prefer a partial shade.

CLEMATIS RECTA.—This is a well-known herbaceous perennial, making a compact plant three or four feet high, and larger still when it has become well established, which is covered in June with many-branched clusters of small, densely crowded flowers, which are creamy white, and fragrant. Old plants which have remained undisturbed for years are quite effective in a herbaceous border among tall Delphiniums and other plants which flower at this season. It is a native of southern Europe and has been cultivated for its flowers in English gardens for three hundred years. We make mention of it at this time, having recently seen a plant which soon promises to bloom under glass. The roots of the plant, which was a seedling three years old,

was set in a large pot last spring and planted in the border, where it flowered as usual. After some hard freezing it was brought in and slowly started, and it is now a strong-looking plant, grown in a cool temperature and ready to be hurried on to what promises to be a successful blooming. It is doubtful whether the flowers will be worth the trouble of producing them, but they may be useful when cut to arrange with other flowers of strong colors. There are so many plants which can only be flowered under glass in this climate, that it seems hardly worth while to select those which will flower as well or better in the open air if they are only left alone.

Cultural Department.

Notes on Carnations.

IF cuttings of the varieties of Carnations to be grown for summer blooming outdoors have not already been set, no time should be lost in getting them in. Some growers lift old plants from their benches and plant outside, and thus obtain a moderate supply of small early blooms, but the plants are always rather unsightly, and so much finer flowers are produced from cuttings rooted in December or January that old plants are best consigned to the rubbish pile. Comparatively few varieties flower satisfactorily outdoors. Among the white kinds, Mrs. Fisher does well, and easily leads all others for outside culture; Nobscot, as a scarlet, does remarkably well here; Hector blooms very freely, but the flowers burn badly. We have not yet found a thoroughly satisfactory pink variety, William Scott being the best we have tested. Ferdinand Mangold gives a fair supply of crimson flowers. Among yellows, we have not been able to obtain good results from any variety yet tried.

Many Carnations are utterly ruined in the early stages of their existence by being propagated in too strong a bottom-heat; weak, spindling plants are always the results of such propagation. An even bottom-heat of sixty degrees and a top-heat of fifty to fifty-five degrees we consider the best. If a propagating bed with such a temperature is not at command the cuttings will root well in a well-drained box of sand placed on the shelf of an ordinary greenhouse. The cuttings must never be allowed to get at all dry; a sprinkling overhead should be given daily, and a thorough soaking every third or fourth day. With proper care ninety per cent. of the inserted cuttings should take root. Some kinds root much more quickly than others. Mrs. Fisher, Nicholson, Nobscot, Ada Byron and some others are fit to pot or box off in about a month from the time they are inserted, while F. Mangold and some of the yellow varieties require a much longer time.

For winter-blooming plants we consider February early enough to put in cuttings, except of such delicate growers as Lizzie McGowan. In taking a tour round some Carnation establishments of late, we noticed thousands of cuttings rooted in the cutting-benches and quantities boxed off. We found that the growers in every case had raised this stock for sale; their own stock of cuttings would be got in later. Of course, it is perfectly natural for trade-growers to commence propagating as early as possible and sell all the stock they can, but we do not believe that plants grown from cuttings inserted in November, December or the first half of January are as good as those raised later in the season. Allowing that the plants are already rooted and ready to box off, some four months must elapse before they can be planted outside (at least in this section), and whether in pots or boxes, this is far too long a period for the young plants to have their roots cramped. The idea often is that as large plants as possible should be grown by lifting-time in the fall, but medium-sized ones are much better to handle, tie up, and clean, and give furthermore fully as fine blooms and as many of them as the larger ones, in proportion to the space they occupy.

Plants in the benches should now be gone over, untied and cleaned. It pays to do this at least twice in the season. In cleaning them we remove all dead and decaying leaves, and also the weak and spindling growths. These growths are best removed; they give but poor flowers, and their removal gives the remaining shoots a better chance. Care ought to be taken not to tie up the plants too tightly, this spoils many of the young growths. Some growers do not stake or clean their plants at all, and we have seen very good flowers on such plants until spring, when the superiority of those cleaned and staked is apparent to the merest novice. With increasing sunlight the benches will now require rather more frequent waterings, and slightly stronger liquid stimulants can safely be given. A surface-dressing of wood ashes or some chemical fertilizer, alternated with a watering of liquid-manure or sulphate of ammonia of moderate strength, every ten days or fortnight, will be found very helpful. If good flowers are desired, disbudding should be practiced. This may not be a profitable thing for trade-growers, but it pays in a private establishment where quality is the first requisite. The operation ought to be performed as soon as the buds can be handled.

Among pink Carnations this season William Scott takes the lead; it gives twice as many flowers as any other pink variety, and seems destined to entirely supersede that worthy old favorite, Grace Wilder. This variety has a good stem and good-sized flower, with a strong calyx; its lack of odor is its only drawback. Madame Diaz Albertini has a remarkably strong stem, the stoutest of any pink-flowering sort we have grown. Its flowers are of large size and of a delicate flesh-pink color, with a strong calyx and a delightful odor. The flowers hold well on the plants, which, however, do not bloom so freely as some other kinds. Nicholson gives us the largest flowers of any pink variety; its bright color and fragrance have made it very popular in the Boston market; it needs a stronger stem, however. Ada Byron has the finest odor of any Carnation we grow; the flower is of good size and beautifully fringed; the plant is of a very vigorous growth, but is a poor winter bloomer. Daybreak still retains its great popularity; with some it rusts badly, but with others it is this season doing remarkably well. Among scarlets, Hector is still the best we have; Portia produces more flowers, but they are not over half the size of the other variety. The Stuart has the ideal stem for a Carnation, and is of a good scarlet shade; it is not so good a flower as Hector, however, and blooms less freely. F. Mangold still holds the lead among crimsons. Lizzie McGowan proves itself the most reliable white; it does not produce so many flowers as Mrs. Fisher, but they are of a purer white color; its stem is better, and it seldom bursts the calyx. Helen Keller seems destined to be a very popular kind, but the plants make rather poor growth; it is the best fancy kind at present on the market. Bouton d'Or, from what we have seen of it, is likely to prove a very popular yellow; the flower is of good size, deep canary-yellow in color, slightly flaked and bordered with carmine; it makes good growth, has a strong calyx, and is, so far, perfectly healthy. Goldfinch, one of Mr. Dorner's introductions, is also a fairly good yellow, which blooms freely; the flowers, however, are much smaller than those of Bouton d'Or, and it is hardly worth growing where the other kind will succeed.

Taunton, Mass. *W. N. Craig.*

CARNATIONS generally, in the neighborhood of Boston, never looked better, and the prospects are that growers hereabouts will make a first-rate display at the forthcoming exhibition of the Carnation Society in Boston next February. Mr. Nicholson, of Framingham, has his William Nicholson and Ada Byron in excellent condition, and they fully maintain in the market and everywhere the reputation they made last season. Some very promising new varieties are also on trial. Mr. Fisher and Mr. Nicholson will show some new scarlets, whites and crimsons, now under number; Mr. Tailby, some yellows, notably Henrietta Sargent, a good pink and a white. The Messrs. Jaune Brothers, of New Bedford, and Mr. Denys Zirngiebel, of Needham, have some fancy varieties which they expect will win favor.

Some rust showed in one or two places this season, but is disappearing with the lengthening days. With regard to this disease, growers agree that cleanliness is the best prevention and remedy. All admit the efficacy of sulphur compounds, and use them, but experience proves that when once the plants are badly affected this treatment is of little apparent benefit. In a visit to a number of growers of Carnations, I found the disease to be worst where the plants were wettest. It is natural to suppose that a lack of root-action and the consequent lessened elimination of moisture will encourage the spread of disease. One grower attributed the poor condition of his plants to overwatering, I, myself, should add, overfeeding, in the earlier stages. The finest plants I have seen have not yet had any stimulants, but with increased sun-power some fertilizers will be given. The best success is had with plants which are kept dry rather than wet, but it is evident that where the root-action is good the plants will quickly become dry.

On the question of soils there is one opinion, and that is, that light soils are best for nearly all varieties. Lime is essential in some form. It is an ingredient of nearly all soils, and thus it is only especially necessary to apply it on heavy soils, and it is generally found in sufficient quantity in all barnyard manures. I was surprised to learn, however, that one grower had failed with William Scott, which almost everywhere has

proved the best pink Carnation. As a reason it was stated that his soil is heavy. This same grower is now taking the best Daybreaks and Ferdinand Mangolds into the Boston market, which would indicate, as has generally proved the case elsewhere, that heavy soils are better for some varieties than for others. Still, it is surprising with regard to William Scott, introduced by Dorner, whose soil, I am informed, is heavy, and that few of his introductions succeed elsewhere on that account.

Mrs. Fisher is still the best all-round white variety, and the most profitable, being also an excellent summer variety. This variety is not grown extensively beyond the limits of the Boston trade. Lizzie McGowan is considered the best white about New York. The difference in choice lies more in the methods of cultivation than in any other particular. If Lizzie McGowan flowered for a longer season, no variety could be more profitably grown, according to New York florists. It is a rather slender, "grassy" grower, and does not take up as much room as Mrs. Fisher, and it may be planted earlier. It needs to be propagated and planted earlier for best results. Tidal Wave is a popular market variety of a deep rose shade, and, although discarded for a time in favor of some of the newer introductions, which it was supposed would supersede it, it is now again coming into favor. It is an abundant producer, but lacks a good stem. E. G. Hill has gradually grown in favor. It is a good clear scarlet of medium size and graceful outline. The stems are long and stout, and the flowers bear few side buds, an important qualification of a good Carnation. In size of flowers, vigor and abundance of crop it does not come up to Hector; some proportion of the latter, however, burst the calyx, a serious defect. Daybreak has become a popular Carnation, and justly so. The color is an attractive shrimp-pink, its flowers extra-large, with stems two feet long. When introduced three years ago it showed a decided tendency to rust, and was not considered as promising as it has since proved. It is looking well everywhere, and carries an abundant crop. Nicholson is another magnificent light pink of different shade, with a tinge of salmon. Ada Byron has not given general satisfaction with the majority of growers, but with the introducer it is a wonderful variety, and, without doubt, the most beautiful in form and the most fragrant of all Carnations. Ferdinand Mangold is still the best crimson.

Uncle John, the Stuart and Jacqueminot are not favorites now, but it is to be hoped the introducers will vindicate themselves at the forthcoming exhibition.

Wellesley, Mass. *T. D. Hatfield.*

Gloxinias.

THIS is a suitable time to sow seed for a crop of these beautiful flowers. Well-drained seed-pans are required, with a mixture of equal parts of loam, leaf-mold and sand, that on the surface being finely sifted. The pan should be stood in water until the soil is thoroughly wet through, and the seed sown on the surface and left uncovered. A pane of glass should be placed over the pan, and over this a sheet of brown paper, the latter being removed after the seeds have started. As the seeds are very fine, the pans should never be watered from the surface. It is preferable to dip the pan, and to have the water soak up from the bottom until it begins to appear on the surface. A warm moist atmosphere is most favorable to germination. When the plants are large enough to handle they should be pricked into boxes containing the same mixture of soil as before, and finally planted into pots with a little dried cow or sheep manure added to the mixture. They should be kept growing as freely as possible, and all flowers pinched off as they appear, except, perhaps, one on each plant to show the variety, so that those not worth growing may be discarded. In the fall they should be ripened off gradually, and the tubers stored away in a dry place in a temperature not exceeding fifty degrees. Toward the end of December they will show signs of starting, and should be planted in boxes in a mixture of sand and leaf-mold and sprinkled lightly until their growth is well begun, when they should be potted singly into small pots at first, and shifted on as they require it. The potting compost should be as open as possible, the pots well drained, and water should be given carefully. The secret of success lies in keeping the soil sweet and free from stagnation. It is not advisable to sprinkle the foliage, since the leaf, being downy, retains the moisture too long. This is the main cause of rust, to which these plants are subject. Gloxinias should be kept in a light position near the glass, but they are benefited by a slight shading from strong sunlight. A temperature of sixty degrees should be maintained by night, with a rise of ten degrees by sun-heat, and fresh air should be admitted at every favorable opportunity. Much can be done toward the improvement of varieties by careful selection and hybridization. We raise a batch from seed every year, and get the best results from the tubers the second year, and, with the exception of a few of the finest varieties, we seldom keep them longer than two years.

Tarrytown, N. Y. *William Scott.*

Mushrooms.

WE often hear of failures in the cultivation of this vegetable, and among the main causes are (1) that the spawn is not good, (2) that the droppings were not in the right condition, and (3) that the bed has been kept too dry or too wet. It is of the first importance that the spawn be fresh. If it has been kept in a store for a long time it is likely to have thick white fibres running through it; these show that it has at some time been kept warm and started to run, which should not occur until it is in the bed. If, on the other hand, it has fine tissues of fibre all through it, it is in the right condition. Another guide as to freshness is that fresh spawn is not hard and that it has a fresh odor.

Two methods are generally followed in preparing the droppings for the bed. These are drying by exposure and drying by heating. I prefer the latter method for the reason that the main object in drying them is to obtain a gentle, lasting heat, and when they are put through a regular course of heating this brings out the rank heat better than when they are dried by exposure. Have as many droppings as will make the size of bed that is desired, discarding all the long straw that can conveniently be separated from them. They should be thrown into a heap and stand until they get hot and begin to have a whitish appearance on the inside of the heap. They should then be spread out thinly, and they will regain their natural color when they are cooled off. They should be treated in this way two or three times until there is no sign of moisture when they are squeezed in the hand; they will then have a pleasant odor.

The bed should be made from one foot to fifteen inches in depth. A good layer of the droppings should be put in and beaten down until it is firm. One layer after another should be added until the required depth is gained. It is desirable to mix a little sifted loam through the droppings since this keeps the heat down and the spawn runs well in it. A convenient rammer is made of a piece of hard wood five inches square and nine inches long, with a short handle in the middle.

The bed must stand a few days before the spawn can be put in, to let the heat rise and decline, for a bed should be spawned only as the heat declines. On this rise and fall of temperature depends much of the future success, for if the heat rises too high it will just as surely fall too low. I prefer that it should not get much above ninety-five degrees, and the heat is retained much longer if the spawn is put in at eighty-five degrees on the decline. Of course, the closer the pieces of spawn are set the more mushrooms may be expected. About six inches apart each way is a good distance. The spawn should be broken into pieces about two inches square, buried two inches deep, and the bed made firm. The edges of the bricks seldom contain much spawn. About one inch of good loam should be put on the top and firmed down with a spade, and a gentle wetting with tepid water should be given; the water should always be of the same temperature as the bed. If the spawn is dry the bricks should have a gentle watering some hours previous to using them. The bed should have a good covering of hay or similar material, which will retain the moisture as well as the heat. The bed should be watched, and if the hay gets moldy it must be taken out and dried, and if the surface of the bed becomes dry syringing is generally all it will require. If on examination the bed is found dry it should be watered, but drenching must be avoided, as this is injurious. Mushrooms appear in a month to six weeks from spawning, and when they show, a watering of dilute nitrate of soda is beneficial; this causes them to grow quickly and prolongs the season of production. The application of nitrate of soda should be repeated every ten days or two weeks until the bed is spent.

Any place which can be kept dark and near an even temperature of fifty degrees will suit them. A cellar is one of the best places. Mushroom-houses are sometimes placed near the boiler-house; this is radically wrong, causing a dry heat, and making frequent dampings necessary. Mushrooms delight in a moist atmosphere, and well repay attention in this particular.

South Lancaster, Mass. *W. Downs.*

Correspondence.

Variety versus Monotony.

To the Editor of Garden and Forest:

Sir,—The article in the issue of Garden and Forest for November 28th, signed "M. C. R.," is full of suggestion and good advice, but I do not endorse the view put forward that a garden filled with a variety of plants, aptly termed a museum, is a place of weariness in comparison with the garden made up of a few bold groups. The charm of the garden is that it is full of change, and herein it differs from the forest or the park, with its wide breadths of tree or shrub. When I go into a garden I look for interest, not a grand effect merely, not a monotone. In such places as M. C. R. prefers one may walk with enjoyment, but after the first view one's thoughts or conversation are generally of other things than those we see. But in the well arranged garden, rich in its collections of plants, there is a running stream of interest and pleasure as one passes from one object or group to another. I maintain that a garden should be a museum first and a picture afterward. This is also true of parts of the garden, such as border, flowerbed, shrubbery or tree group. A border filled with red roses only may be a grand picture, but it fails to interest as the mixed border does, which we examine from end to end. In large gardens broad effects are easy, but they ought not to be repetitions of the same or a few plants. In the smaller garden these broad effects are not possible, unless one wishes to be thought eccentric. I sometimes walk in Richmond Park, the finest of our metropolitan parks, in which the groves of Oak and Fir that Repton delighted in are a striking feature. There is much pleasure in such a walk, but it does not compare with, is not of the same character as, the pleasure of walking in such a garden as Batsford Park, where there is both breadth and great variety of garden pictures. Variety maintains interest and feeds the mind in a way that monotony cannot do. To compare a garden with a collection of pictures, whether would it be best to have four big pictures on the four walls of one's room or a collection of smaller pictures arranged with proper taste?

London. *W. Watson.*

[A picture-gallery exists solely to show each of its individual treasures to the best advantage, and no one thinks that its contents, taken together, should also make a picture or that the paintings which it contains should be grouped or "composed" into larger pictures. Too many persons assume that a garden exists for its individual plants, in the same way that a gallery does for its individual pictures; but there certainly can be an arrangement of the contents of a garden which will give a very complete and satisfying effect, an effect entirely different from that which comes from the enjoyment of the individual flowers or plants. No objection was made by M. C. R. to variety, and no preference was expressed for a few bold groups; a plea for harmony is not an argument for monotony. The title of the article expresses its purpose. It was not aimed against Accumulation, but against Accumulation without Disposition. It is perfectly easy to have a variety of plants and yet to dispose of them so that a consistent purpose will reign throughout, and the garden will not only make a picture, but a new picture, from every point of view. Every one has seen drawing-rooms full of valuable furniture and objects of art which were ugly and wearisome because their contents were unskillfully disposed. A skilled artist might so arrange these objects that the beauty of each would be enhanced by its position and surroundings, while the effect of the whole would be pleasing. It is possible, however, to crowd a place so full of objects beautiful in themselves that no arrangement can save it from a cluttered and depressing appearance, and every one can recall the impression made by some simple room which contained nothing really precious, and yet wore an expression at once of comfort and of grace. A man may ransack the earth for vegetable curiosities and rarities, and fill his garden full of them, and yet it may be a spotty and and uninteresting place to look at. It will certainly be such a place if he has been governed by the desire for accumulation alone and gives no thought to the disposition of his material.

After all, it should never be forgotten that there are gardens of every size, and an infinite variety of tastes and habits to be gratified by them. And so long as one really loves his garden and finds health and comfort and delight in caring for it, he is to be congratulated, even if, to the critical eye, its pictorial effect is not satisfying.—Ed.]

Salix balsamifera.

To the Editor of Garden and Forest:

Sir,—It will doubtless interest the readers of Garden and Forest to know that Salix balsamifera, Barratt, was collected in the White Mountains by the late William Boott. There is a specimen of undoubted S. balsamifera in the Boott Herbarium, marked in Mr. Boott's handwriting, "Salix cordata, Lake of the Clouds, Mount Washington, 12th July, 1855."

This plant, then, was collected thirty-two years after its discovery by Mr. Little, and twenty-four prior to its detection by Messrs. Pringle and Faxon.

Botanical Garden, Cambridge, Mass. *Merritt Lyndon Fernal.*

Apple-scab in Nebraska.

To the Editor of Garden and Forest:

Sir,—Last season served to illustrate in a striking way the effect of climate upon fungus depredations. While the Apple-orchards of New York were so overrun by the scab fungus that the crop in many sections was almost a failure, Nebraska was so free from it that in the vicinity of Lincoln scarcely enough could be found to illustrate the effects of the disease on the fruit in lecturing to students. The early part of the season in the eastern states was marked by long-continued wet weather, particularly favorable to the development and spread of fungous diseases. In Nebraska just the reverse conditions prevailed, for the season was an unusually dry one, and at the very time when crops in the east were suffering from too much rain, crops in Nebraska were suffering for the want of it. The chief point aimed at in the spraying experiments at this station was to find whether it would be profitable to cheapen the cost by weakening the mixtures used. It is needless to say that the results were entirely negative, for all were alike useless, and the arsenites alone would have given just as good results. Of course, the present season was unusual, but, to a certain extent, the same conditions prevail every year, and fungi of all kinds are much less abundant here than in the eastern states, consequently the directions for spraying best suited to the east do not apply here. Moreover, some of the enemies which trouble eastern growers have not yet reached us. It should not be inferred from this, however, that we are altogether happy, for in the "blight," "rotten heart," etc., we have enough to occupy our attention. For the present it does not seem advisable to recommend more than two applications of the Bordeaux mixture to Apple-trees in this section, and, indeed, if this season were a fair sample, none at all would be much better.

Lincoln, Neb. *Fred W. Card.*

The Forage Problem in Iowa.

To the Editor of Garden and Forest:

Sir,—The farmers of the north-west, particularly those living west of the Mississippi River, have had some valuable lessons from the dry season of 1894. They have not learned much about weeds or fungi, since diseased plants of all kinds have never been as scarce as during the months of June, July and August, and our annual weeds have suffered quite as much as the perennial grasses in meadows, lawns and pastures, and they will, therefore, be freer from these pests than they have been for many years. The season has been of particular interest, because of the opportunity afforded to study the forage problem. Many forage plants, for example, have been found wanting in their ability to stand long droughts.

The chief forage-plants of the state are Blue Grass, Poa pratensis; Clover, Trifolium pratense; incidentally also, White Clover, Trifolium repens. Indian Corn heretofore in this state has not been used extensively as a forage-plant, but this year it has come into prominence for this purpose. In fact, had it not been for corn, live stock could not have been carried through the months of July and August. This suggests the important fact that the farmers of Iowa have annually been wasting millions of dollars' worth of the fodder which is contained in the Maize crop. It is a well-known fact that the corn-stalk contains about fifty per cent. of the dry matter and over thirty per cent. of the protein of the plant. It is not improb-

able that hereafter Corn-fodder will be saved more largely and used in place of hay.

Blue Grass has shown itself capable of standing, in an unusual degree, the severe drought. In July very little green Blue Grass could be seen. Pastures, meadows and lawns looked bare, but with the rains of August and September they became green, the strong root-stocks of this excellent and nutritious grass spreading in all directions. Timothy has also stood up well, but it afforded less pasturage than Blue Grass. Clover made a better growth and gave more hay per acre than any of the old forage-plants. In seasons of this kind it is more valuable to have a mixture of Clover, Timothy and Blue Grass than to grow them separately. The most remarkable feature of these forage-plants, especially Blue Grass, is that although but little remained in pastures, cattle and horses thrived. In other words, the grasses were practically cured in the field, and hence more nutritious than in seasons of great moisture.

Of the little-tried leguminous plants none are more promising in this state than the Cow Pea, Dolichos Katiang, var. Sinensis, and Soja Bean, Glycine hispida, and none are more valuable than the several hardy varieties introduced by Professor Georgeson, of Kansas. Under the most trying circumstances these plants made a large growth, and contained an abundance of fodder. Sweet Clover, Melilotus alba, has also been tested, while it made a rapid and good growth. It is not to be recommended because of its weedy nature and the injurious effects which may result from its use. Crimson Clover, Trifolium incarnatum, has been a failure. Alfalfa, Medicago sativa, on the right kind of soil, is a remarkable drought resister, but it has not been tried extensively.

The Polygonum Sachalinense, which has been commented on so widely as a valuable forage-plant for dry years, made an excellent growth. At no time did it show the wilting effects of the dry weather. I should not advise the extensive planting of this Knot-weed. Its deep-running root-stocks are liable to be a menace in removing it from the field. It may, however, pay to have a few acres.

From these statements it will be seen that the forage problem resolves itself into the use of several different plants, and no farmer should rely exclusively on a single plant. More and greater reliance should be placed on Corn, which, under the most unfavorable conditions, will produce good and cheap forage. Sorghum must also come to the front as a forage-plant. Soja Bean may be relied on. For fall and spring pasturage Blue Grass is the best of all of our Grasses. It fails, however, during the summer months, July and August. During this time Corn, Rape, Soja Bean and Cow Pea may be substituted.

Agricultural College, Ames, Iowa. *L. H. Pammel.*

Recent Publications.

The Woman's Book. Dealing practically with modern conditions of home-life, self-support, educational opportunities and every-day problems. In two volumes. New York: Charles Scribner's Sons.

These large elegant volumes, with their four hundred illustrations, touch upon such a wide range of topics that it is easy to understand why so many authors were engaged in their preparation. On the intellectual side of life, such subjects as Books and Reading and the art of travel are treated by T. W. Higginson and Elizabeth Bisland, with an important chapter on the Education of Woman, by Rev. Lyman Abbott. On the practical side, P. G. Herbert and Mary Cadwallader Jones write of the various fields of useful activity which are now open to women, and W. O. Stoddard gives instruction in such details of business affairs as keeping accounts and the management of real estate. The various branches of household economy are discussed by Lilian W. Betts, while hygiene of the home and the training of children are the subjects of articles by J. W. Roosevelt, M.D., and Kate Douglas Wiggin. Besides this, we have essays on the æsthetics of dress and of house-furnishing, with the inevitable instructions in regard to behavior in polite society. Altogether, the book is as useful as it is beautiful, which is saying a good deal, as no better specimen of the bookmaker's art than this has lately appeared from the press at such a reasonable price. It is really an encyclopædia on most of the subjects in which women are interested, and it treats them in a broad way, while a very complete index makes all its information readily available.

The special matter which brings a book like this within the scope of a notice by GARDEN AND FOREST is found in two chapters: one on Home Grounds, by Samuel Parsons, Jr., and another on Flower Gardens, by Mr. J. N. Gerard. Mr. Parsons writes in an instructive way of the good and bad features of building lots, with directions for draining, and some excellent advice about the situation of a dwelling-house and the grading of its surroundings. He next takes up the subject of planting, gives the most approved methods of arranging the lawn and of planting its borders, with lists of trees and shrubs which will be found useful, and the best way to group them. One might readily criticise his selection of trees and shrubs, but no list would satisfy every one, and his descriptions of various plants with their special adaptations will be helpful to the novice. It is not an easy thing in the space of thirty pages to give a great amount of instruction on the planning and planting of home-grounds, but the advice, so far as it goes, is sound, and it will be useful if it does no more than convince the reader that there is such a thing as a proper arrangement of home-grounds, that this is a matter worth study and inquiry, and that the preparation for it should begin at the very beginning, not only before the house is built, but before its location is decided, so that house and grounds together may be one consistent scheme.

Mr. Gerard's field is rather more restricted, and, therefore, he goes more into detail, and gives the best of counsel as to the preparation of the soil, the proper exposure of flower-beds and the selection of plants to fill them. Of the essential matters which should be borne in mind when flowers are to be cultivated for house adornment, few are neglected in this little monograph. There are paragraphs devoted to hardy herbaceous perennials, to annuals, to flowers for cutting, to climbers, to window and veranda boxes, to aquatics, and descriptions of such helps as cold frames and greenhouses, with hints on some specialties like Orchid-culture. The advice is not of that desiccated sort which gets into ordinary catalogues, but the paper is full of little out-of-the-way bits of information which throw side-lights upon the practice of gardening, and cannot help but be beneficial to any woman, or any man, for that matter, who begins in a cautious, experimental way to plant flowers to make his home attractive.

The tenth edition of the *Forest Tree-planters' Manual*, prepared by Mr. J. C. Barrett, Secretary of the Minnesota State Forestry Association, has reached us, and, like earlier editions of this work, contains a large amount of interesting information and stimulating matter. It embraces a list of the indigenous trees and shrubs of Minnesota, with remarks on their distribution in the state and their economic uses and values, with such characters as will assist in their determination. There are articles also on how to manage forest seeds, seedlings and cuttings, filled with practical suggestions, articles on entomology and forest-zoölogy, and on the economic and climatic conditions of the forests of Minnesota. Such publications as these are valuable in increasing the popular knowledge of forests and forest-planting, branches of agriculture in which Minnesota has for many years taken an active part.

The Medical Plants of Tennessee, respecting their commercial value, with an analytical key, descriptions in aid of their recognition, and notes relating to their distribution, time and mode of collection and preparation for the drug market, by Dr. A. Gattinger, of Nashville, has recently been published under the direction of T. F. B. Allison, Commissioner of Agriculture of Tennessee. This is a useful book, containing brief botanical descriptions of the economic plants of the state sufficiently full to make it possible, by the aid of the excellent analytical key, to distinguish them readily, with descriptions of their medicinal uses and commercial value.

Notes.

The Miller Raspberry, which has already been described in this journal (vol. vii., page 300), will be offered by leading nurserymen this spring. It has hitherto been grown only by commercial planters in Delaware and Maryland for the sake of its fruit, and has not been disseminated.

From a private letter dated on the last day of the year we learn that Chrysanthemums were still enlivening the gardens of Santa Barbara, California, with Roses, Violets and Salvia splendens still in bloom. Cestrum aurantiacum and C. elegans were also in flower; the Libonias, Passiflora manicata and Bignonia venusta were showing some blooms, while Veltheimia speciosa was just coming on with Paper White Narcissus in full bloom.

The Tree Tomato, Solanum betaceum, is a shrubby plant, a native of Central America, growing to a height of five or six feet with large shining leaves, fragrant flesh-colored flowers and fruit said to be as large as a duck's egg and of similar shape. It is at first purple, but gradually assumes a warm reddish color, so that the plant is really ornamental as it is grown in southern California. The plants bear the second year from the seed and the fruit ripens continuously for several months. The fruit will never be of any commercial importance, but it may be eaten raw, and when it is stewed with sugar it has a slightly subacid flavor which is very refreshing.

The forty-sixth volume of the *Garden*, which begins with the first issue of this year, is appropriately dedicated to Mr. Edward Whittall, the English merchant of Smyrna, who has enriched English and American gardens with many new and beautiful plants from the hills of Asia Minor, many of which are perfectly hardy. Among these are species and varieties of Crocus, Chionodoxa, Cyclamen, Fritillaria and Sternbergia. Mr. Whittall is still a young and active man, and we cordially unite with Mr. Robinson in wishing that he may live long to continue the good work of distributing plants which have for ages bloomed unseen or unappreciated in those mountain solitudes.

A bulletin which gives notes on the Strawberries grown at the Geneva Station, New York, last year, contains an illustration of four rows of a seedling raised at the station and known as No. 198. The strong, upright fruit stems and large, vigorous leaves are conspicuous. This variety was only exceeded in total yield by five others, and it was especially noted for its large production late in the season, three-fourths of the entire crop, 144 ounces on thirty-three square feet, having been picked after the third of July. This is a remarkable showing. The berries are of a good dark color and large size, but they are not of the highest quality. The extreme lateness of its season of bearing, however, ought to give this variety a special value.

We are sorry to learn that Mr. C. M. Atkinson, one of the best all-round gardeners that America has seen, has been obliged, through physical infirmity, to retire from the charge, which he has held for nearly thirty years, of the gardens and estate of Mr. John L. Gardner, of Brookline, Massachusetts. This place has long been known to lovers of horticulture for its well-grown fruits and flowers, and especially for many of those old-fashioned hard wood greenhouse-plants which are so sadly neglected in most gardens of the present day, and which Mr. Atkinson grew to perfection. His skill, however, was not limited to any single field, and he was equally successful with Azaleas, Japanese Irises, Roses, Orchids, Violets, and all sorts of greenhouse and hardy plants.

At the meeting of the directors of the various experiment stations in Washington last autumn there was exhibited the photograph of a Tomato-plant which originated in the garden of Colonel M. V. Moore, of Auburn, Alabama. The plant covered a trellis about fifteen feet square, and it was said that during the season it produced more than four hundred well-developed fruits, some single specimens of which weighed nearly a pound, the average weight being about six ounces, or a hundred and fifty pounds, say, as the entire yield during the season. The fruits were round and smooth, and they grew in clusters of from three to seven. The flesh was solid, richly flavored and finely grained. The plant has been perpetuated by cuttings, and seed of some of the largest fruits has been preserved.

A late number of the *Gardeners' Magazine* contains an excellent illustration of a fruiting branch of the Sea Buckthorn, Hypophaë rhamnoides. In his description of the plant, Mr. George Nicholson says that few growers of trees and shrubs are acquainted with the plant, although its bright orange-colored berries set closely along the branches and remaining all winter long, make it especially valuable. The fruits are somewhat bleached by hard freezing, but in late autumn they literally glow in the bright sunlight. Hypophaë is hardy in our northern states, but it is less common here in cultivation even than in Great Britain; in fact, we have never seen good fruiting plants of it in America. The genus is dicœcious, and the staminate plants are, of course, useless for decorative purposes. That it should be better known and more generally grown must be the opinion of any one who has seen it in some Swiss valley in September, when its bright fruit makes a striking display.

The latest news from Florida shows that the orange crop will not be a total loss in some of the groves in the central part of the state and along the south-western coast. Although heavy frosts prevailed in these parts and the thermometer fell to twenty-eight degrees, there was no long-continued cold, as throughout other sections, where the freezing weather lasted for three days, and the oranges were frozen solid on the trees. Later on these oranges dropped, and the ground was thickly covered with useless fruit, and in many instances the leaves also fell, while the bark burst the entire length of the trunks. Besides the supplies of Mediterranean fruit under way to supply the deficiency, the New York market is ready to take the supply from Jamaica, Porto Rico and Cuba, so that, although there will not be as many oranges of the first quality as was expected, there will be no scarcity of fairly good fruit at reasonable prices. In ordinary seasons the shipments of oranges from Jamaica stop when the Florida season is fully under way, and this is true also of Cuba oranges. Jamaica oranges sold at auction on Saturday at $4.50 a barrel for the best, while damaged Florida fruit could hardly be sold at any price. Mediterranean oranges are selling at wholesale for $2.50 to $3.00 a box. Tangerine oranges bring $5.00 a box for a grade which brought $2.50 a fortnight ago. Almeria grapes of good quality can be had for thirty cents a pound. Hot-house strawberries from New Jersey cost $3.00 a pint, and hot-house pineapples from Florida may be had as low as thirty-five cents each.

Dr. Bornet has published in the *Bulletin de la Société Mycologique de France* a sympathetic notice of Philibert Picart, the French engraver, who is specially known to Americans by his engravings in Engelmann's classical work on *Cactaceæ*, and in the first volumes of Sargent's *Silva of North America*, upon which he had been exclusively engaged for several years before his death. "Philibert Picart," Professor Bornet tells us, "was born in Paris on the 2d of December, 1825. A pupil in the School of Design of the Rue de l'École de Médecine, he obtained, at the age of sixteen, the highest prize given in that establishment. Soon becoming the principal support, and then the head of a numerous family, he would have been obliged to abandon it for military service had not Louis Philippe generously come to his rescue and purchased a substitute for him from his private purse. With the assistance of his mother, who was as brave as himself, he succeeded, by persistence and self-sacrifice, in bringing up his six brothers and sisters. One of his brothers, Eugène, who was also an excellent engraver, was, until the end of his life, the assiduous assistant of Philibert, dying two years before him. The list of the great works to which Philibert Picart has contributed is a long one. Les Quinquinas de Weddel, the Cactaceæ of Engelmann, l'Arboretum Segrezianum of Lavallée, the Plants of the Orient of Jaubert & Spach, the Jardin Fruiter du Muséum of Decaisne, the Chilian Voyage of Gay, the Batrachospermes of Sirodot, the Forest Trees of North America of Sargent, are familiar to every one. A skilled entomologist, the zoölogists are not less indebted to Picart than the botanists. 'An indefatigable worker,' said Monsieur Migneaux, in the sympathetic address delivered at his funeral, 'conscientious, an excellent observer, with a talent supple and ingenious, which specialists and savants, whom he aided, can alone appreciate. Picart was certainly the most complete expression of that group of engravers who have illustrated the works of natural history in the second half of this century. Among the multitude of scientific publications to which he contributed it is proper to mention as the most important, perhaps, the works on cryptogamous plants of Tulasne and Thuret. The plates of this work, engraved from drawings of Riocreux, are simply masterpieces, the like of which will, perhaps, never be seen again.' Picart possessed rare unselfishness and integrity. The man was the equal of the artist."